place a sensation in between two others which will seem in absolute value equally distant from each of the other two, or whether we attempt to make the differences of sensation, *i. e.*, the differences of the muscular tensions, alike. In the latter case Weber's law will hold. The law, too, will hold, for the same reason, when the direction of the difference of sensation is perceived, but is not so likely to hold when the bare difference, without a perception of the direction of this difference, is tested.

Interesting and original as this theory is, it cannot be accepted without much experimentation by rigid methods and with due reference to other modes of explanation of the results. It is certainly difficult to conceive that the difference between two pressures or two sounds can be equal in any sense to the differences between the lengths of two lines. What seems to have taken place is this: the weakest and the strongest sensation in each sense were known, as also the number of different sensations in between; the smallest sensation was naturally associated with the shortest length, and the movements of the eyes or the arms having their natural limits, these limits stood for the most intense sensations. The results would then simply show that it is possible to keep in mind these ten sensations or differences of sensation in the disparate spheres of sensation, and make the several intervals or magnitudes correspond roughly each to each. That this power is interesting and worthy of study cannot be doubted, but that it can only be explained by the theory of muscular-tension feelings, or proves this theory, is by no means clear. J. J.

Sur la perception des radiations lumineuses par la peau chez les Protées aveugles des grottes de la Carniole, RAPHAEL DUBOIS. Comptes rendus. T. CX, p. 358, 17 Fév., 1890.

The ocular vision of these creatures is so imperfect that they will run against objects set in their way. They nevertheless perceive the difference between light and darkness, (in part by means of a kind of dermal vision most distinctly marked at certain points about the head and tail), and are profoundly disturbed by the former. In the dark they will remain for a long time in one place, but on being stimulated with a beam of light soon make efforts to escape. This characteristic has been used by Dubois to determine what might be called their reaction-times. In 43 experiments the average time was 11 seconds; in 30, in which the eyes were covered with an opaque mixture, there was reaction in about 24 seconds, except in three cases where there was none at all. With colored lights (produced with colored glass) for which the intensity of the illumination decreased in the order, yellow, blue, red, green, violet, and with the eyes open the following times were found: violet 26 seconds, blue 23, red 16, green 13, yellow 10.5. Where the eyes were covered the results with colored lights were conflicting, probably from too frequent repetitions of the tests. The order of preference of the animals was: black, red, yellow, green, violet, blue, white. The same author has studied the visual ability of the molusk *Pholas dactylus*, see *Comptes rendus*. CIX, pp. 233 and 320.

Experimentelle Studien über den Zeitsinn. MICHAEL EJNER. Inaug. Diss. Dorpat. 1889.

The intervals studied by Ejner were very much larger than those used by most previous experimenters, 0.5, 1, 2, 3, and 4 minutes. The method was that of average error and both forms of it were used: single reproductions, for which the standard is given each time, and multiple or serial reproductions where the standard is only given at the beginning of the series. The time was measured with a stop-watch of some kind,